WHAT IS CLAIMED IS:

1. A free-space optical laser communication system supporting optically-separated signal transmission and reception channels, and employing laser beam speckle tracking mechanism and speckle-to-fiber/detector locking mechanisms along the signal reception channels thereof for automatically stabilizing variations in the detected intensity of received laser beam carrier signals caused by atmospheric turbulence along said signal channels.

2. A free-space optical laser communication system having optically-separated signal transmission and reception channels at all terminal points in the communication system,

wherein laser beam speckle tracking (i.e. following) mechanisms are employed in transmission channels of system to achieve a first level of optical signal intensity stabilization at signal detector of signal reception channel; and

wherein speckle-to-fiber/detector locking mechanisms are employed along the signal reception channels of system to achieve a second level of optical signal intensity stabilization at the signal detector in the signal reception channel.

3. A method of automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along the signal reception channels of a free-space optical laser communication system supporting optically-separated signal transmission and reception channels.

4. Apparatus for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along the signal reception channels of a free-space optical laser communication system supporting optically-separated signal transmission and reception channels.

5. A free-space optical laser communication system supporting optically-combined signal transmission and reception channels, and employing laser beam speckle tracking mechanism and speckle-to-fiber/detector locking mechanisms along the signal reception channels thereof

for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along said signal channels.

6. A free-space optical laser communication system having optically-combined signal transmission and reception channels at all terminals in the communication system,

wherein laser beam speckle tracking mechanism is employed in the signal transmission channels of all terminals in the communication system to achieve a first level of optical signal intensity stabilization at signal detector in each signal receiving channel, and

wherein speckle-to-fiber/detector locking mechanism are employed in the signal reception channels of all terminals in the communication system to achieve a second level of optical signal intensity stabilization at signal detector in each signal reception channel.

7. A method of automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along the signal transmission channels of a free-space optical laser communication system supporting optically-combined signal transmission and reception channels.

8. Apparatus for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along the signal transmission channels of a free-space optical laser communication system supporting optically-combined signal transmission and reception channels.

9. A free-space adaptive optical laser communication system supporting optically-separated signal transmission and reception channels and employing laser beam speckle tracking mechanism and speckle-to-fiber/detector locking mechanisms along the signal reception channels thereof for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along said signal channels.

10. A free-space adaptive optical laser communication system having optically-separated signal transmission and reception channels at all terminals in the communication system,

wherein wavefront sensing (WFS) and wavefront correction (WFC) mechanisms are employed in the signal transmission and reception channels of system (i.e. traditional adaptive optics) to improve the condition of the laser beam at the signal detector in the signal reception channel (i.e. reduce the size of the spot at the detector plane);

wherein laser beam speckle tracking mechanisms are employed in the transmission channels of system so as to achieve a first level of optical signal intensity stabilization at signal detector in the signal reception channel; and

wherein speckle-to-fiber/detector locking mechanisms are in signal reception channels of system to achieve a second level of optical signal intensity stabilization at signal detector in each signal reception channel.

11. A method of automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along the signal reception channels of a free-space adaptive optical laser communication system supporting optically-separated signal transmission and reception channels.

12. Apparatus for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along the signal reception channels of a free-space adaptive optical laser communication system supporting optically-separated signal transmission and reception channels.

13. A free-space adaptive optical laser communication system supporting optically-combined signal transmission and reception channels and employing laser beam speckle tracking mechanism and speckle-to-fiber/detector locking mechanisms along the signal reception channels thereof for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along said signal channels.

14. A free-space adaptive optical laser communication system having optically-combined signal transmission and reception channels at all terminals in the communication system,

wherein wavefront sensing and wavefront correction mechanisms are employed in signal transmission and reception channels of all terminals in the communication system (i.e. adaptive

optics) to improve the condition of the laser beam at the receiver (i.e. reduce the size of the spot a the detector plane);

wherein laser beam speckle tracking mechanisms are employed in signal transmission channels of all terminals in the communication system to achieve a first level of optical signal intensity stabilization at signal detector of each receiving channel; and

wherein speckle-to-fiber/detector locking mechanisms are employed in signal receiving channels of all terminals in the communication system to achieve a second level of optical signal intensity stabilization at signal detector of each receiving channel.

15. A free-space adaptive optical laser communication system supporting optically-combined signal transmission and reception channels and employing speckle-to-receiver-aperture locking mechanism along the signal transmission channels of the system and laser beam speckle tracking mechanisms and speckle-to-fiber/detector locking mechanisms along the signal reception channels thereof for automatically stabilizing variations in the intensity of received laser beam carrier signals caused by atmospheric turbulence along said signal channels.

16. A free-space adaptive optical laser communication system having optically-combined signal transmission and reception channels at all terminals in the communication system;

wherein wavefront sensing and wavefront correction mechanisms are signal transmission and reception channels of all terminals in the communication system (i.e. adaptive optics) to improve the condition of the laser beam at the receiver (i.e. reduce the size of the spot a the detector plane);

wherein speckle-to-receiver-aperture tracking mechanisms are employed in the transmission channel of the communication system and laser beam speckle tracking mechanism in the reception channels thereof, so as to achieve a first level of optical signal intensity stabilization at signal detector of each receiving channel; and

wherein speckle-to-fiber/detector locking mechanisms are employed in signal receiving channels of all terminals in the communication system so as to achieve a second level of optical signal intensity stabilization at signal detector of each receiving channel.